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LEAK RATE EXPERIMENTS FOR THROUGH-WALL ARTIFICIAL CRACKS

Report No. 90-289-K

J.M. Boag, M.T. Flaman, and B.E. Mills
Applied Mechanics Section
Mechanical Research Department

ABSTRACT

An extensive experimental program of leak rate testing has been carried out for different geometries of artificial cracks in a test fixture which simulates circumferential cracks occurring in heat transport piping under various thermo-hydraulic conditions. The objective of this, the first phase of this program is to obtain a data base of measured leak rates from artificial piping cracks and to compare test results with leak rate predictions obtained from the Electric Power Research Institute (EPRI) developed analytical model called PICEP/1/. Experimental results for leak rates associated with rectangular and flare crack geometries are presented. Initial results of comparing analytical leak rate predictions with the experimental data are also presented.

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EXECUTIVE SUMMARY

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Applied Mechanics Section
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An experimental program of leak rate testing has been carried out for different geometries of artificial cracks in a test fixture which simulates circumferential cracks occurring in heat transport piping. This test fixture was designed so that different artificial crack geometries can be easily tested, and through wall crack pressures and metal temperatures can be accurately measured. Leak rate data was obtained for both rectangular (parallel-sided) and flare type artificial crack shapes for thermo-hydraulic conditions similar to those found in CANDU-type nuclear power piping. The objective of these tests was to obtain a data base of measured leak rates from artificial piping cracks and to compare test results with leak rate predictions obtained from the EPRI developed analytical model called PICEP/1/.

Initial comparison of the experimental leak rate data to leak rates predicted by the PICEP computer model show reasonable correlation (i.e. almost all analytical data fell within ±25% of the experimental data).

Future work will involve more detailed comparisons, further crack opening displacement measurements, and development of Ontario Hydro's own computer model to predict leak rates.

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To Mr. M.A. Machacek
Manager
Darlington Engineering Dept.

LEAK RATE EXPERIMENTS FOR THROUGH-WALL ARTIFICIAL CRACKS

1.0 INTRODUCTION

The possibility of a sudden and complete rupture of large diameter piping in nuclear power plants represents a serious concern as it can directly impact on public and plant personnel safety and can result in severe and costly damage to reactor buildings and equipment. Large diameter piping is used in many areas of nuclear reactors and considerable cost is involved in attempting to design plants to minimize the consequences of a complete pipe rupture during operation.

At Ontario Hydro, the 'Leak-Before-Break' (LBB) approach has been employed to demonstrate that sudden, catastrophic failure of critical nuclear heat transport piping will not occur. The LBB approach is based on the application of elastic-plastic fracture mechanics, and the concept that pipe deterioration would be progressive and not a sudden occurrence, and would first manifest itself in a through-wall breach of the pressure boundary resulting in a non-catastrophic leak. This leak would be detectable and remedial action could be taken well before the dangerous situation of a large break would arise.

This report describes an extensive experimental leak rate testing program, which is intended to support analytical efforts regarding use of the LBB concept at Ontario Hydro. Details of the test fixture and measurement techniques will be presented, as well as some experimental leak rate results. Finally, a comparison between experimental results and a leak rate predictive computer model is presented.

2.0 EXPERIMENTAL TEST SETUP

2.1 General

The experimental program involves the use of small test fixtures containing precise artificial crack geometries to obtain leak rate information for various thermo-hydraulic conditions.

The fluid used for these tests was treated deionized and demineralized water.

The leak rate tests have been carried out in the OHRD-Burst Test Facility. Special attention has been paid to the accurate measurement of: leak rates, process parameters, through-wall fluid temperature and pressure, and crack face metal temperatures.

2.2 Leak Rate Test Fixture

A schematic diagram of the leak rate test fixture is shown in Figure 1. The fixture consists of two precisely machined stainless steel cylindrical halves. A small continuous groove was machined into the face of one half of the fixture to outline the desired through-thickness crack shape. A precisely measured shim (which determines the crack opening displacement or COD) is positioned on the fixture face just outside of the continuous groove. An aluminum wire, slightly larger in diameter than the depth of the groove, is then placed into the groove and the two cyclindrical halves are bolted together. The aluminum wire crushes to the thickness of the shim, thus providing a leak-tight boundary (similar to an "O"-ring seal) and a well-defined artificial crack geometry.

Ports have been machined into the test fixture to obtain precise temperature and pressure data in the stagnation chamber as well as through the depth of the artificial crack.

The parameters of the three artificial crack geometries discussed in this paper are given in Table 1. The aspect ratios of these artificial cracks are similar to those expected in large, thick-walled piping.

TABLE 1 - Test Fixture Crack Geometries

Test No.	*Fixture No.*	*Crack Shape (mm)*	*COD (mm)*	*Crack Length at the Outer Surface (mm)*	*Avg. Surface Roughness (mm)*	*Crack Depth (mm)*
1	SS-A1	Flare (75.2°)	0.102	98.6	2.03×10^{-4}	38.1
2	SS-A2	Rectangular	0.109	48.8	2.03×10^{-4}	38.1
3	SS-A3	Flare (75.2°)	0.508	98.6	2.03×10^{-4}	38.1

The fixture was designed to be rigid to minimize any changes in COD that might occur during testing. (Any changes in COD occurring during the experiments could significantly affect the comparison with predicted results obtained from the analytical leak rate model because the model assumes an constant value for the COD.) Because of the difficulty in directly measuring COD changes during testing, a finite element analysis was generated using PATRAN[1] to estimate any COD changes across the crack face. The finite element analysis was based on the geometry of Fixture SS-A1 described in Table 1 and the following conditions: a stagnation chamber pressure of 10 MPa and a constant fixture temperature of 300°C. Various crack face entrance and exit pressures, and bolt clamping pressures between the fixture halves were assumed.

Based on this finite element study, it was determined that COD changes of less than ±2.0 percent could be expected. It was also observed that the reduction in COD was fairly constant over the crack depth (i.e. no significant rotation of the crack face occurred). It was concluded that this amount of change in COD during testing of this fixture would have an effect of less than ±2.0 percent on the leak rate results.

Following the leak rate testing, some initial efforts to measure COD changes in our fixture under test conditions have been made. The preliminary results of these measurements indicate somewhat larger COD changes than those predicted by the finite element study. COD changes of up to 5 percent were found to occur during testing. Since the flow in the test fixture cracks is generally turbulent, this COD variation will

[1] PATRAN, Finite Element Analysis Software, Copyright PDA Engineering, 2975 Redhill Avenue, Costa Mesa, U.S.A. 92626.

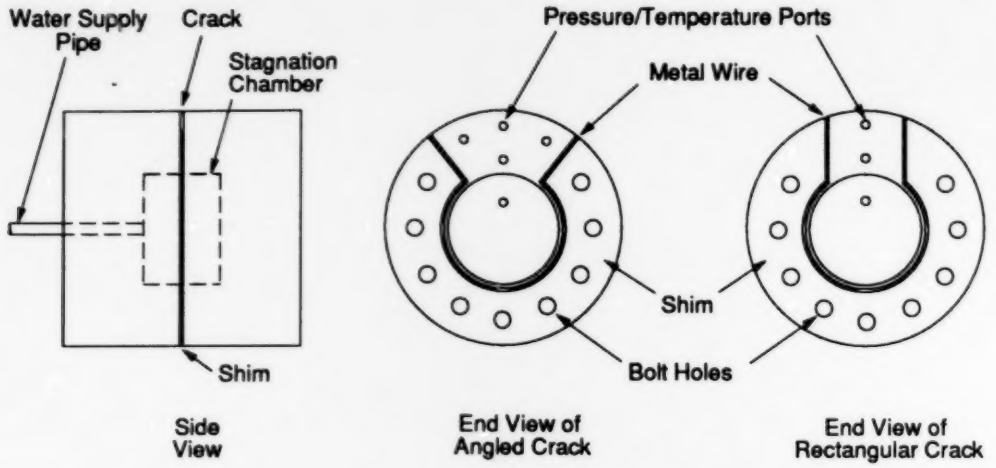


FIGURE 1

SCHEMATIC OF LEAK RATE TEST FIXTURES

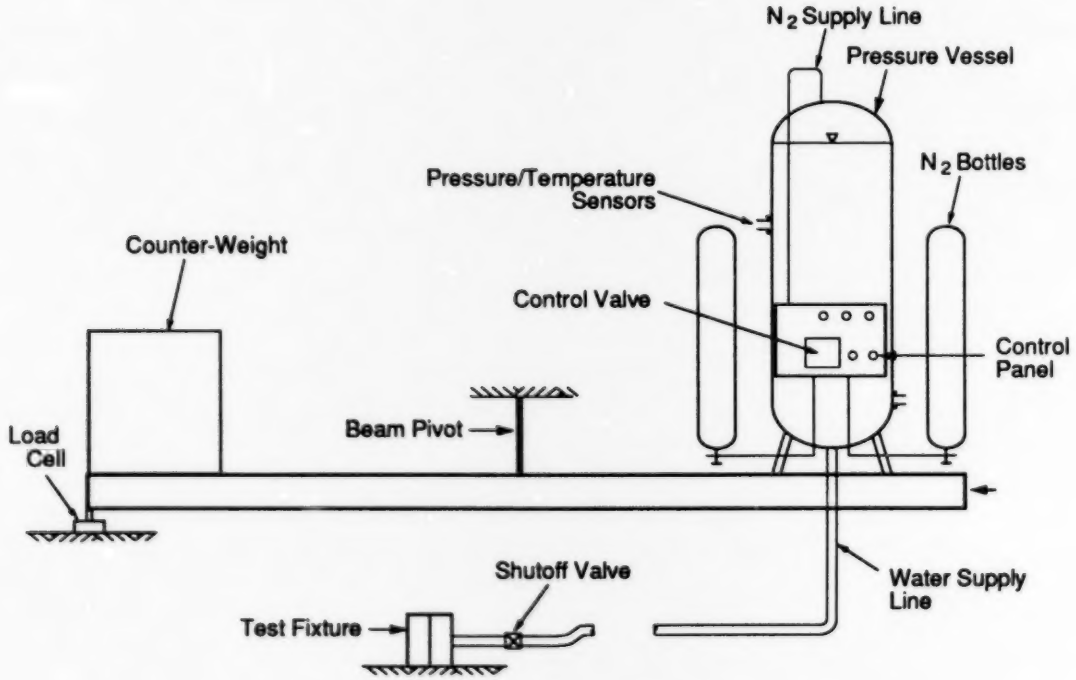


FIGURE 2

SCHEMATIC OF WATER SUPPLY SYSTEM

affect the measured leak rates by less than 5 percent. Details of the COD measurements are given in Appendix I.

2.3 Weigh Balance Water Supply System

An important requirement for the experimental program is the accurate measurement of leak rates for each test fixture crack geometry. For these tests, a pressure vessel with a capacity of approximately 200 kg of water is used as a reservoir to supply water to the leak-rate fixture under different thermo-hydraulic conditions. At a maximum allowable CANDU reactor piping leak rate of 0.5 kg/sec, the inventory of water in the pressure vessel allows for approximately 400 seconds of continuous testing.

The weight loss of water in the pressure vessel (as recorded by a precision load cell) is measured as a function of time to establish leak rates for each test. One approach to measuring the weight of water lost is to weigh the pressure vessel directly. However, there are some difficulties in making accurate leak rate measurements with this "direct weighing" approach. One difficulty is the large tare weight of the pressure vessel and associated equipment (approximately 1500 kg) compared with the weight of water (200 kg). This significantly reduces the achievable accuracy of the weight measurement because of the high total weight. Another difficulty is the effect of any mass addition of nitrogen which is used as a cover gas during testing; this additional mass either has to be calibrated for or mathematically corrected for in determining accurate leak rates.

Rather than directly weighing the pressure vessel to measure water loss, the OHRD approach is to mount the pressure vessel, nitrogen gas cylinders, and all ancillary equipment on a balancing platform as shown in Figure 2. Small adjustments to the location of the nitrogen tanks in relationship to the pressure vessel were made during initial pressurization tests with nitrogen only. By suitably locating the nitrogen tanks on the weigh balance system, the effect of nitrogen mass shift (from the gas cylinders to the pressure vessel) on the load cell output during the leak rate tests is eliminated. In this manner, the load measuring equipment can be sized to the weight of the water only, rather than to the entire weight of all the equipment, thus yielding much more accurate results.

Calibration of the weigh balance system was performed so that water loss from the pressure vessel (as measured by a precision load cell) could be correlated to fixture leak rates. Water was removed in stages from the pressure vessel and the mass of the water at each stage was determined using a high-accuracy balance and traceable reference weights. The load cell output was recorded against the total mass of water removed from the pressure vessel. A best fit linear regression was then performed on the calibration data. Calibration data is given in Appendix II.

Based on this procedure, the calibration was determined to be linear and the accuracy of all reported leak rate measurements is typically within ±.005 kg/sec. Re-calibration of the weigh balance system has been performed periodically during the current testing program and has been found to be repeatable within 0.05 percent.

3.0 EXPERIMENTAL RESULTS

3.1 Test Procedure

For the tests described in this report, the pressure vessel was filled with deionized and demineralized water. Chemical analyses of the water is given in Appendix III. The water in the pressure vessel is heated to and maintained at a predetermined temperature for each set of tests using a 40 kW immersion heater. The nitrogen cover gas pressure is controlled (via a flow control valve) so that different pressure conditions can be obtained in the test fixture stagnation chamber. Typically, the pressure in the test fixture stagnation

chamber can be changed four or five times (at constant temperature) to obtain different amounts of fluid sub-cooling for each fill-up of the pressure vessel. This approach enables each set of tests to be performed under relatively constant temperature and water chemistry conditions.

The target thermo-hydraulic water conditions in the test fixture stagnation chamber are given in Table 2.

TABLE 2 - Test Program Target Thermo-Hydraulic Conditions

Temperature (°C)	*Pressure (MPa)*
170	2.0
170	4.0
170	8.0
170	10.0
170	12.0
250	6.0
250	8.0
250	10.0
250	12.0
275	7.5
275	9.0
275	10.0
275	12.0
300	10.4
300	11.0
300	12.0

3.2 Data Collection and Analysis

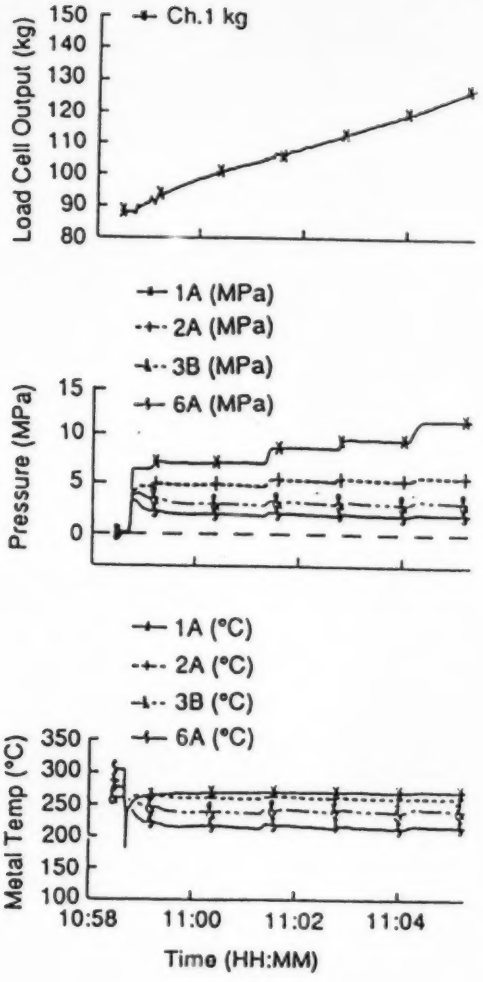
A computerized data logger automatically collected water loss, pressure, and temperature data at 30 readings/second during the entire test. Typical plots of water loss in the pressure vessel vs. time as well as pressure and metal temperatures through the depth of the artificial crack vs. time are given in Figure 3.

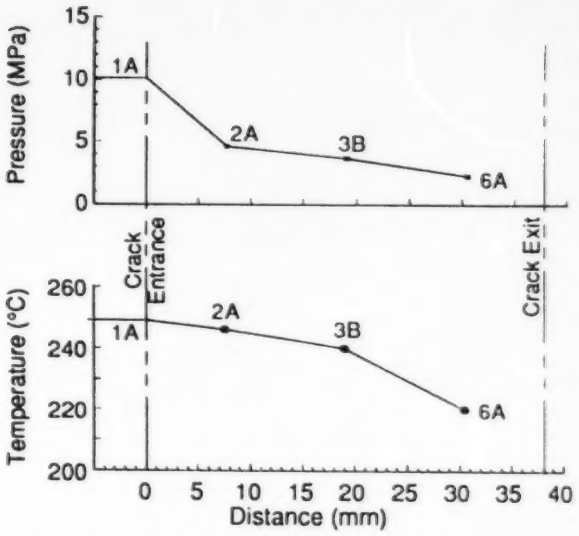
It can be observed from the metal temperature and pressure graphs (Figure 3) that equilibrium conditions are achieved within 10 - 20 seconds of the start of testing.

After removing the data points measured during the transient conditions (i.e. at the start and end of each test), the "average" leak rate over the test period for the fixture is determined from the slope of a best fit straight line through the load cell output. Similarly, "average" pressures and temperatures are determined throughout the fixture using this data analysis technique.

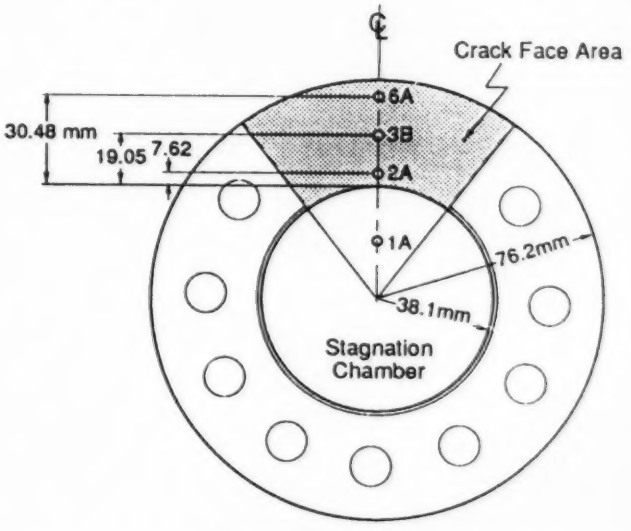
4.0 LEAK RATE RESULTS AND DISCUSSION

The leak rate results for different crack geometries under various thermo-hydraulic conditions in the fixture stagnation chamber are shown in Figure 4. Records containing all measured data for a typical leak rate test are given in Appendix IV.





Through-Wall Temperature/Pressure Profiles



Cross-Section of Test Fixture Showing Measurement Locations

FIGURE 3

TYPICAL MEASUREMENT DATA

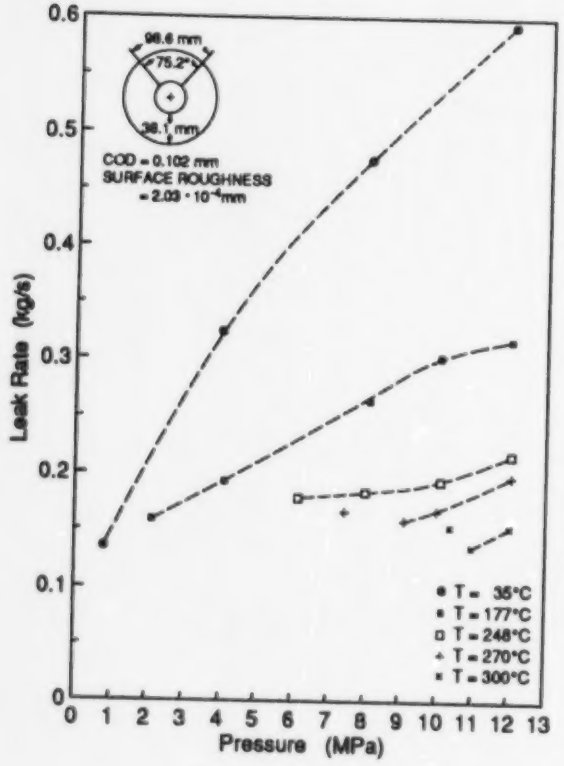


FIGURE 4 (I)

LEAK RATE RESULTS: FIXTURE SS-A1

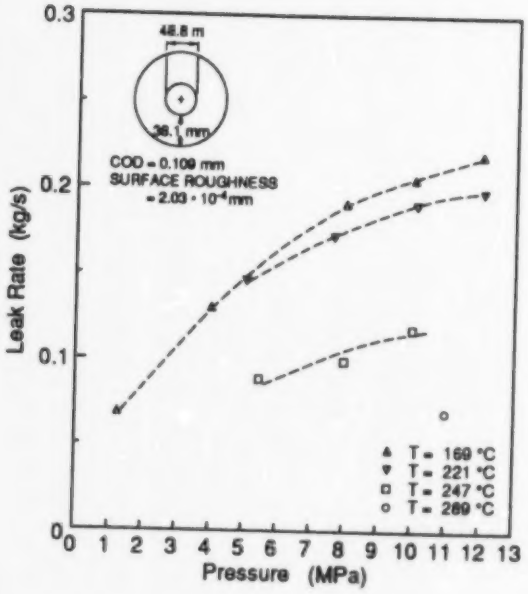


FIGURE 4 (II)

LEAK RATE RESULTS: FIXTURE SS-A2

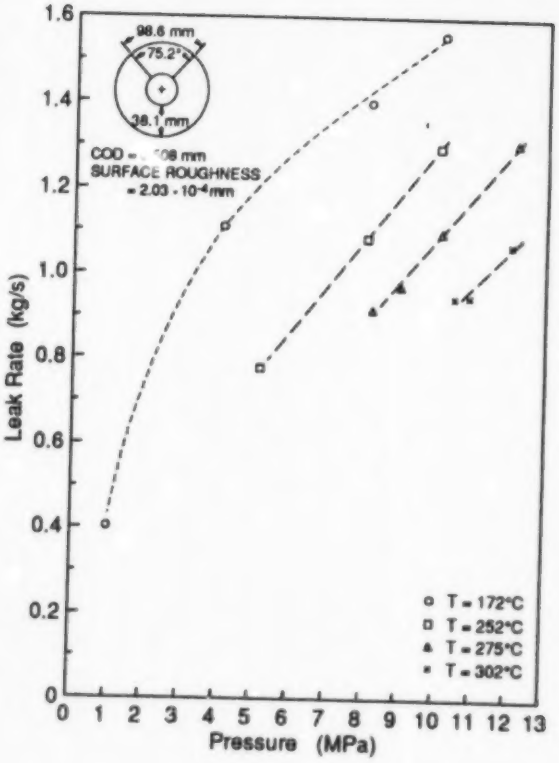


FIGURE 4 (III)

LEAK RATE RESULTS: FIXTURE SS-A3

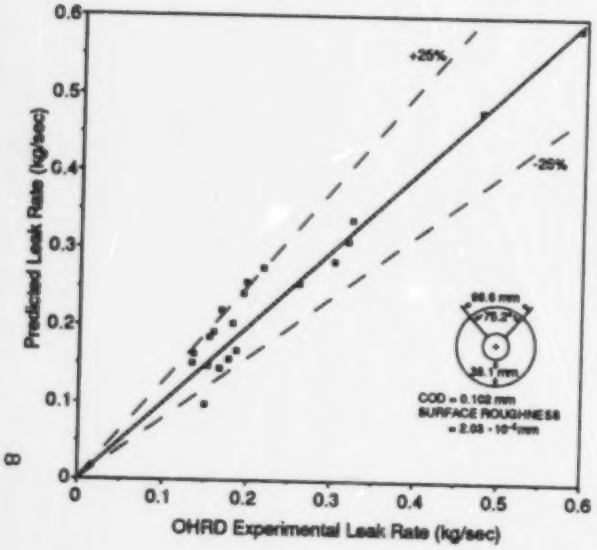


FIGURE 5 (I)

COMPARISON OF EXPERIMENTAL AND PREDICTED LEAK RATES FIXTURE SS-A1

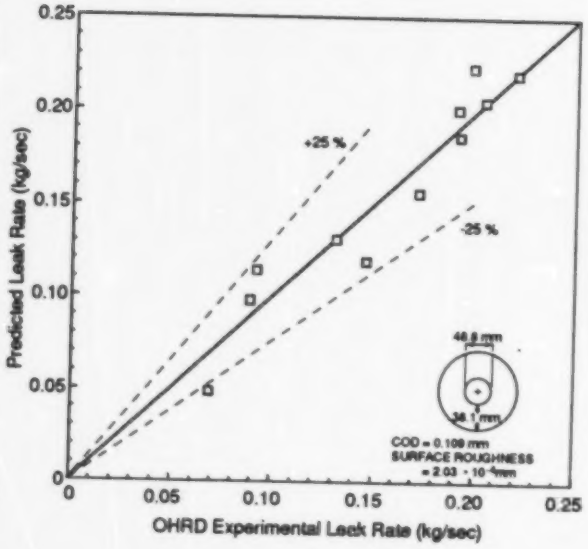


FIGURE 5 (II)

COMPARISON OF EXPERIMENTAL AND PREDICTED LEAK RATES FIXTURE SS-A2

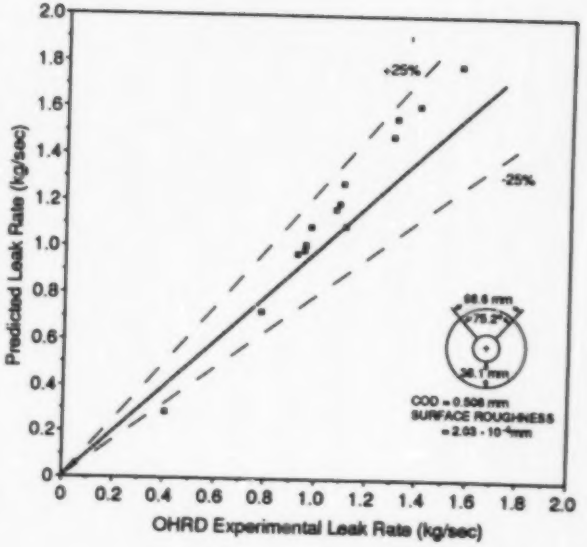


FIGURE 5 (III)

COMPARISON OF EXPERIMENTAL AND PREDICTED LEAK RATES FIXTURE SS-A3

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4.1 Experimental Results

The leak rate is a strong function of stagnation pressure, particularly for cases with a large degree of subcooling. This observation is typical of single-phase liquid flow. However, as the amount of subcooling decreases (and the stagnation chamber fluid temperature increases), the leak rate becomes a weaker function of the stagnation pressure. This decrease in dependance on stagnation pressure occurs because as the degree of subcooling is decreased, the inception of choked flow within the crack face moves closer to the crack entrance. This trend is most clearly shown in Figures 4ii and 4iii, i.e. for the smaller cracks where flashing occurs in the upstream portion of the crack. It should be noted that in the parallel-sided crack geometry, as opposed to the flared cracks, the fluid flow is friction-restricted. Thus, for the parallel-sided crack geometry, as the degree of subcooling decreases, the friction-induced pressure drop will cause the choking point to move upstream.

Fluid choking plays an important role in limiting the leak rate as witnessed by the flattening of the curves in Figure 4 for higher stagnation chamber temperatures. This phenomenon has also been observed in other experimental results/2/.

4.2 Comparison with Theoretical Predictions

Of particular interest in this program was a comparison between the experimentally measured leak rates and those determined by a predictive computer model.

Some preliminary results of such a comparison are presented in Figures 5(i), 5(ii) and 5(iii). Solid lines are the one to one correlation between experimental data and theoretical predictions. These graphs show the measured leak rates versus those predicted by the Pipe Crack Evaluation Program (PICEP). PICEP has been developed by the Electric Power Research Institute (EPRI). Its leak rate calculation is based on a homogeneous nonequilibrium critical flow model with several modifications to account for friction, crack turns, and fluid conditions.

In virtually all cases, the correlation between the predicted and measured leak rates is within ±25 percent. This is considered a reasonable amount of agreement. Comparisons between predicted and measured leak rates by other researchers show similar levels of agreement/3,4,5/. Accounting for any changes in COD during testing in the predictive model is one possible way the correlation could be improved. As our data base of COD measurements increases, this correction will be attempted.

5.0 CONCLUSIONS

1. A weigh balance water supply system has been designed, constructed, and commissioned to obtain reliable and accurate leak rate data in support of the Ontario Hydro LBB approach. Recent calibration of the weigh balance system has shown that a leak rate data accuracy of ±.005 kg/sec can be readily obtained.

2. A leak-tight fixture has been designed such that different artificial crack geometries can be easily configured and tested. In addition, through wall crack pressures and metal temperatures can be accurately measured using this fixture.

3. Initial leak rate data have been reported for both rectangular (parallel-sided) and flare type artificial crack shapes under thermo-hydraulic conditions similar to those found in CANDU-type nuclear power piping.

4. Initial comparison of the experimental leak rate data to leak rates predicted by the PICEP computer model show reasonable correlation, i.e. almost all data within ±25%.

6.0 RECOMMENDATIONS

It is recommended that further leak rate testing be carried out in order to better determine the effects of surface roughness COD, and discharge aspect ratio on leak rates. This will most effectively assist in formulating Ontario Hydro's own leak rate model.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to Messrs. S. Ray and T. Caputo who carried out the experiments. The financial and technical support of the Darlington Engineering and Nuclear Safety Departments of Ontario Hydro is also greatly appreciated.

Approved By:

G.J. Clarke
Manager
Mechanical Research Department

Reviewed by:

T.P. Byrne
Acting Section Head
Applied Mechanics Section

Submitted By:

J.M. Boag
Engineer
Applied Mechanics Section

M.T. Flaman
Unit Head-Structural Integrity Measurements Unit
Applied Mechanics Section

B.E. Mills
Engineer
Applied Mechanics Section

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APPENDIX I

COD MEASUREMENT TECHNIQUE

APPENDIX I

COD MEASUREMENT TECHNIQUE

A custom designed fixture is used to measure crack opening displacement (COD). Figure I(i) is a schematic drawing of the test fixture. This fixture consists of a rigid yoke with four independent sensors. These sensors are strain gaged bending beams. Four high strength wires connect the sensors to the crack face via existing temperature and pressure ports. Each sensor consists of a cantilever beam with a four active arm strain gage bridge. Any change in the COD will create a bending moment within the cantilever. This moment will result in change in resistance of the strain gages. By comparing the change in resistance of the four sensors, both change in COD and crack face rotations can be estimated.

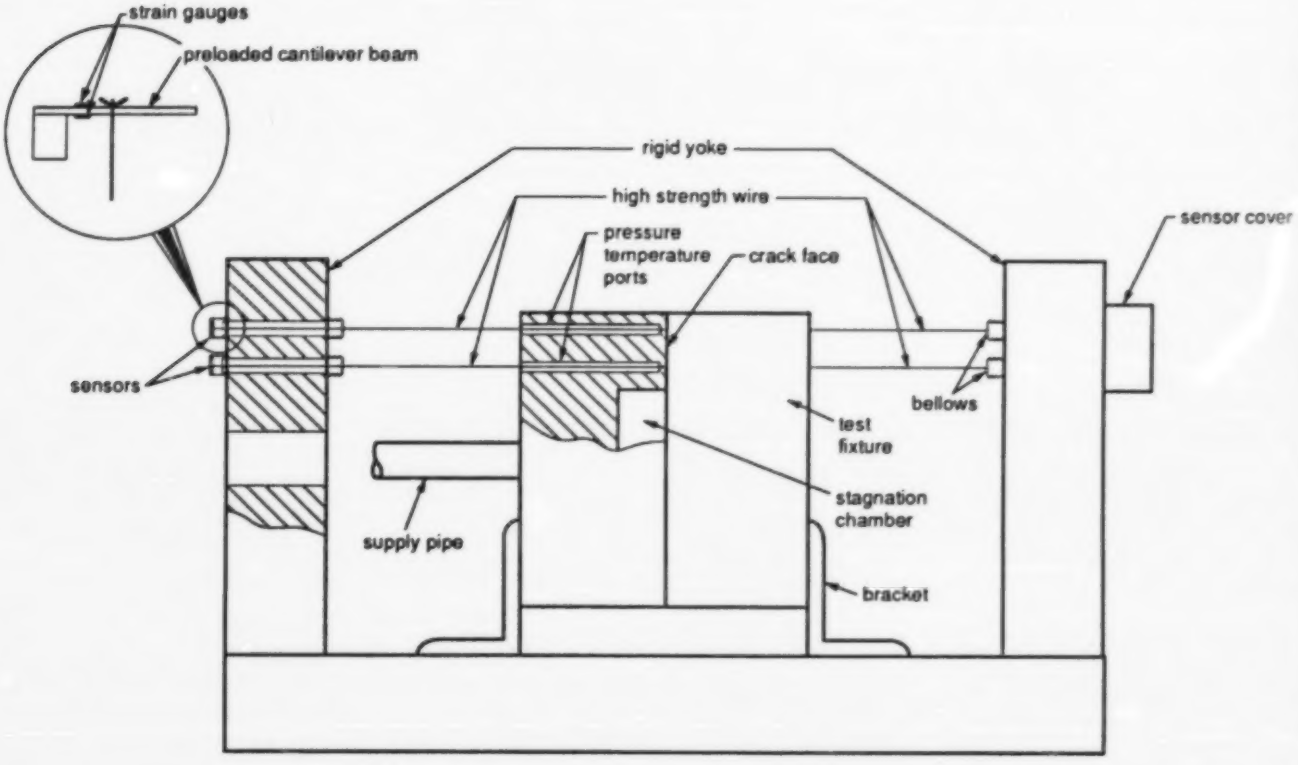

FIGURE I(I)

SCHEMATIC OF CRACK OPENING DISPLACEMENT FIXTURE

APPENDIX II

CALIBRATION CURVE FOR THE WEIGH BALANCE WATER SUPPLY SYSTEM

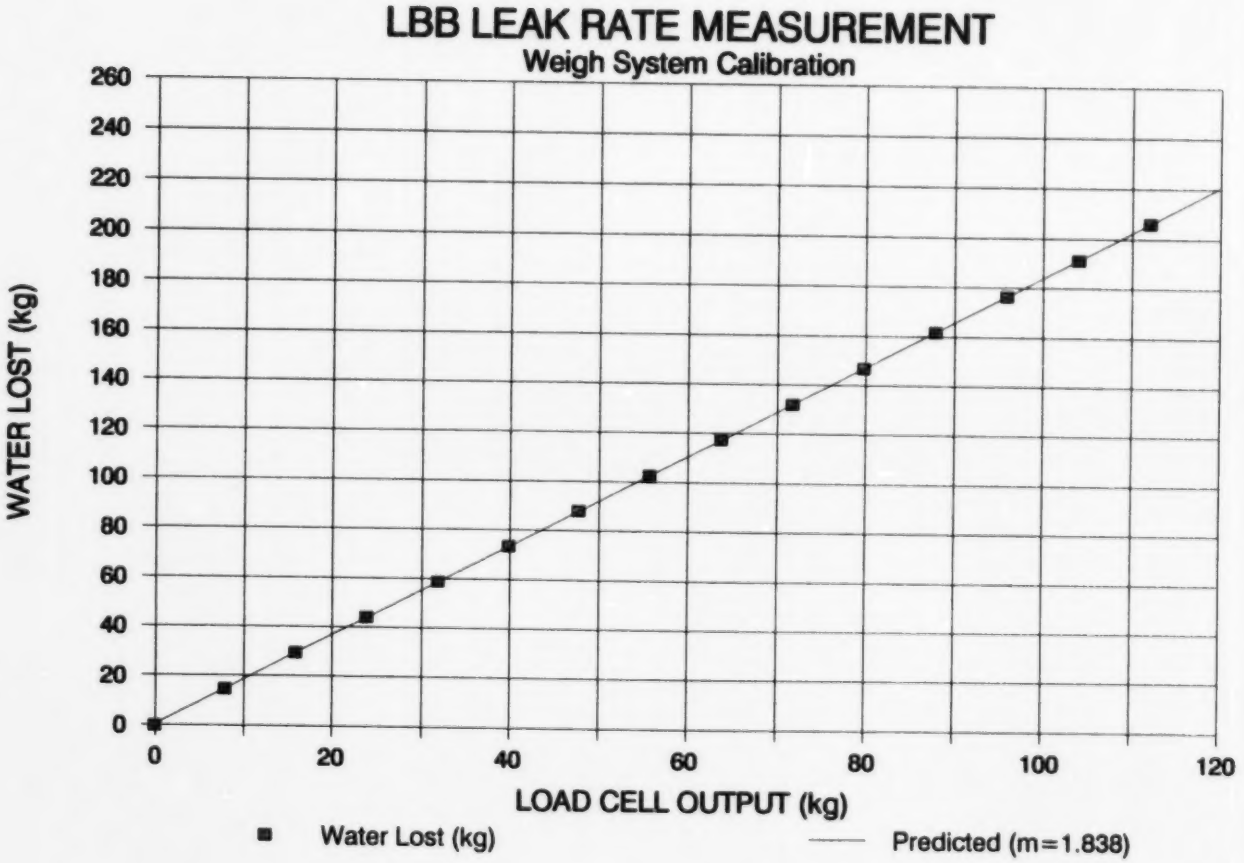

Figure II-1
Water Supply System Calibration

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APPENDIX III

WATER CHEMISTRY ANALYSIS

APPENDIX III

WATER CHEMISTRY ANALYSIS

The "leak rate" test uses deionized and demineralized water. The chemistry of the water was analyzed periodically through the test program by the Chemical Research Department of Ontario Hydro Research Division. Following is a typical water chemistry analysis.

No	Sample Name	Analyte	Result	Units
1	JUL 20/89 #1-A3-4	pH	7.9	units
		Lithium by ICP	0.3	ppm
		Conductivity	0.61	mS/m
		Turbidity by Nephel	1.8	NTU
		Iron by ICP	0.54	ppm
		Nickel by ICP	<0.05	ppm
		Chromium by ICP	<0.05	ppm
		Calcium by ICP	0.43	ppm
		Chloride by IC		ppm
		Sulfate by IC		ppm
		Sodium by ICP	0.47	ppm
2	JUL 13/89 #1-A3-3	pH	6.9	units
		Lithium by ICP	0.24	ppm
		Conductivity	0.93	mS/m
		Turbidity by Nephel	2.6	NTU
		Iron by ICP	1.7	ppm
		Nickel by ICP	<0.05	ppm
		Chromium by ICP	<0.05	ppm
		Calcium by ICP	0.63	ppm
		Chloride by IC		ppm
		Sulfate by IC		ppm
		Sodium by ICP	0.45	ppm
3	AUG 9/89 #1-C1-4	pH	10.	units
		Lithium by ICP	0.2	ppm
		Conductivity	6.6	mS/m
		Turbidity by Nephel	1.3	NTU
		Iron by ICP	6.6	ppm
		Nickel by ICP	<0.05	ppm
		Chromium by ICP	<0.05	ppm
		Calcium by ICP	0.7	ppm
		Chloride by IC		ppm
		Sulfate by IC		ppm
		Sodium by ICP	7.9	ppm

APPENDIX IV

EXPERIMENTAL MEASUREMENT DATA

LBB LEAK RATE TESTS

Test Date: 5/7/1989 Data Disc ID: LBB02 TEST 1
Data Scans Used: 36 to 43
Test Fixture: A3 Material:Stainless Steel

Crack Length: 100 mm
Crack Width: 0.5 mm

Nominal Test Temperature: 250 oC

Test Duration: 29 s

Average Stagnation Chamber Temperature: 221 oC

Average Stagnation Chamber Pressure: 3750 kPa

Average Mass Flow Rate: 0.692 kg/s

Other Temperatures and Pressures:

Location	Average Pressure (kPa)	Average Temperature (oC)
2A	2336	181
3B	2231	202
4A	2001	206
5A	1911	206
5B	1731	217
6A	1753	99
Outer surface of fixture:		84

LBB LEAK RATE TESTS

Test Date: 5/7/1989 Data Disc ID: LBB02 TEST 2
Data Scans Used: 52 to 59
Test Fixture: A3 Material:Stainless Steel

Crack Length: 100 mm
Crack Width: 0.5 mm

Nominal Test Temperature: 250 oC

Test Duration: 28 s

Average Stagnation Chamber Temperature: 230 oC

Average Stagnation Chamber Pressure: 5158 kPa

Average Mass Flow Rate: 0.915 kg/s

Other Temperatures and Pressures:

Location	Average Pressure (kPa)	Average Temperature (oC)
2A	2649	176
3B	2519	209
4A	2470	193
5A	2146	207
5B	1936	209
6A	2076	87
Outer surface of fixture:		76

LBB LEAK RATE TESTS

Test Date: 5/7/1989 Data Disc ID: LBB02 TEST 3
Data Scans Used: 132 to 139
Test Fixture: A3 Material:Stainless Steel

Crack Length: 100 mm
Crack Width: 0.5 mm

Nominal Test Temperature: 250 oC

Test Duration: 29 s

Average Stagnation Chamber Temperature: 237 oC

Average Stagnation Chamber Pressure: 7753 kPa

Average Mass Flow Rate: 1.249 kg/s

Other Temperatures and Pressures:

Location	Average Pressure (kPa)	Average Temperature (oC)
2A	3004	195
3B	2911	217
4A	2870	206
5A	2553	210
5B	2343	216
6A	2555	73
Outer surface of fixture:		66

LBB LEAK RATE TESTS

Test Date: 5/7/1989 Data Disc ID: LBB02 TEST 4
Data Scans Used: 201 to 206
Test Fixture: A3 Material:Stainless Steel

Crack Length: 100 mm
Crack Width: 0.5 mm

Nominal Test Temperature: 250 oC

Test Duration: 21 s

Average Stagnation Chamber Temperature: 255 oC

Average Stagnation Chamber Pressure: 9715 kPa

Average Mass Flow Rate: 1.240 kg/s

Other Temperatures and Pressures:

Location	Average Pressure (kPa)	Average Temperature (oC)
2A	4947	225
3B	4049	221
4A	3316	220
5A	2599	216
5B	2364	229
6A	3071	79
Outer surface of fixture:		68

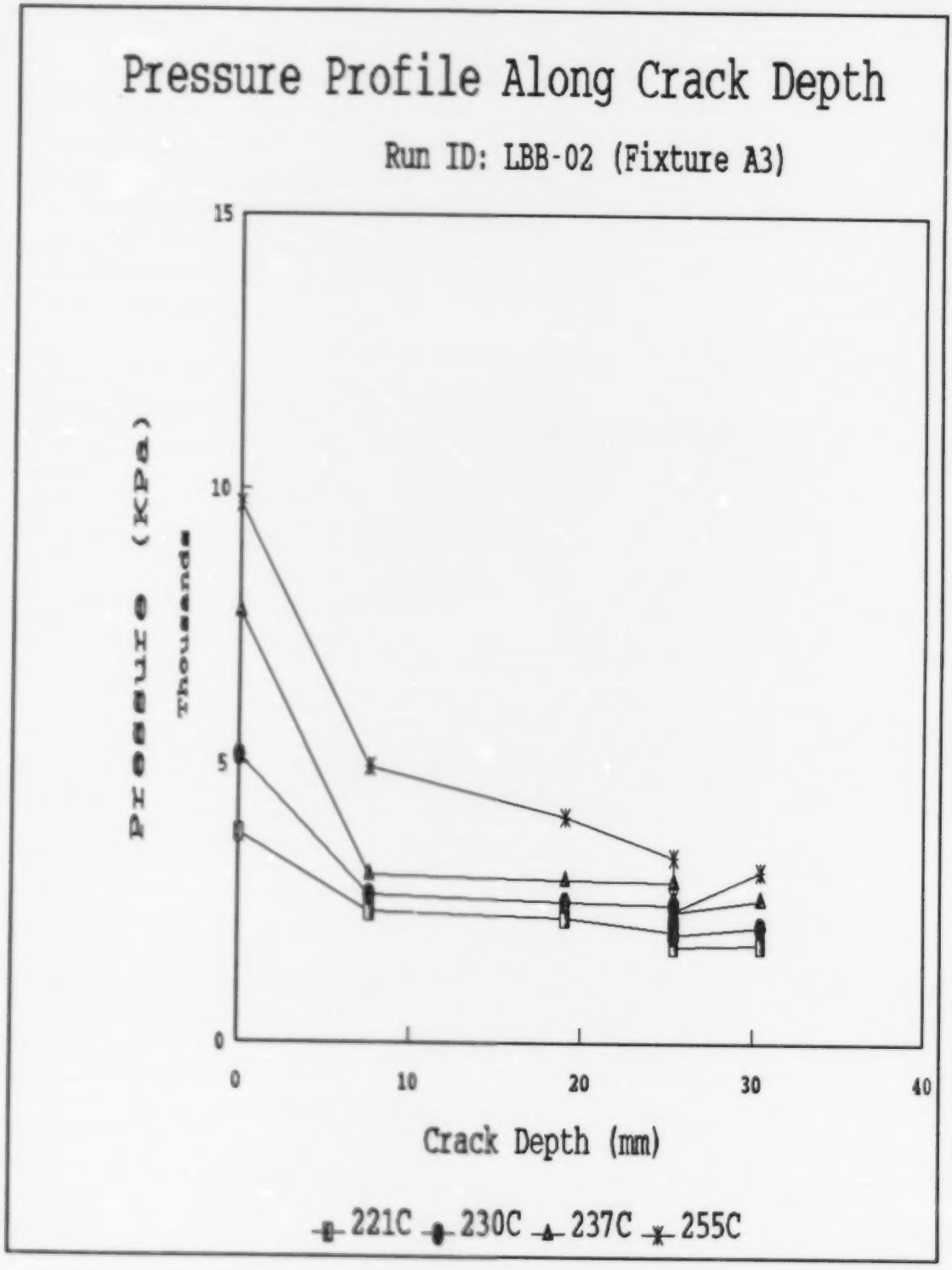

FIGURE AIV-1

Pressure Profile Through Crack

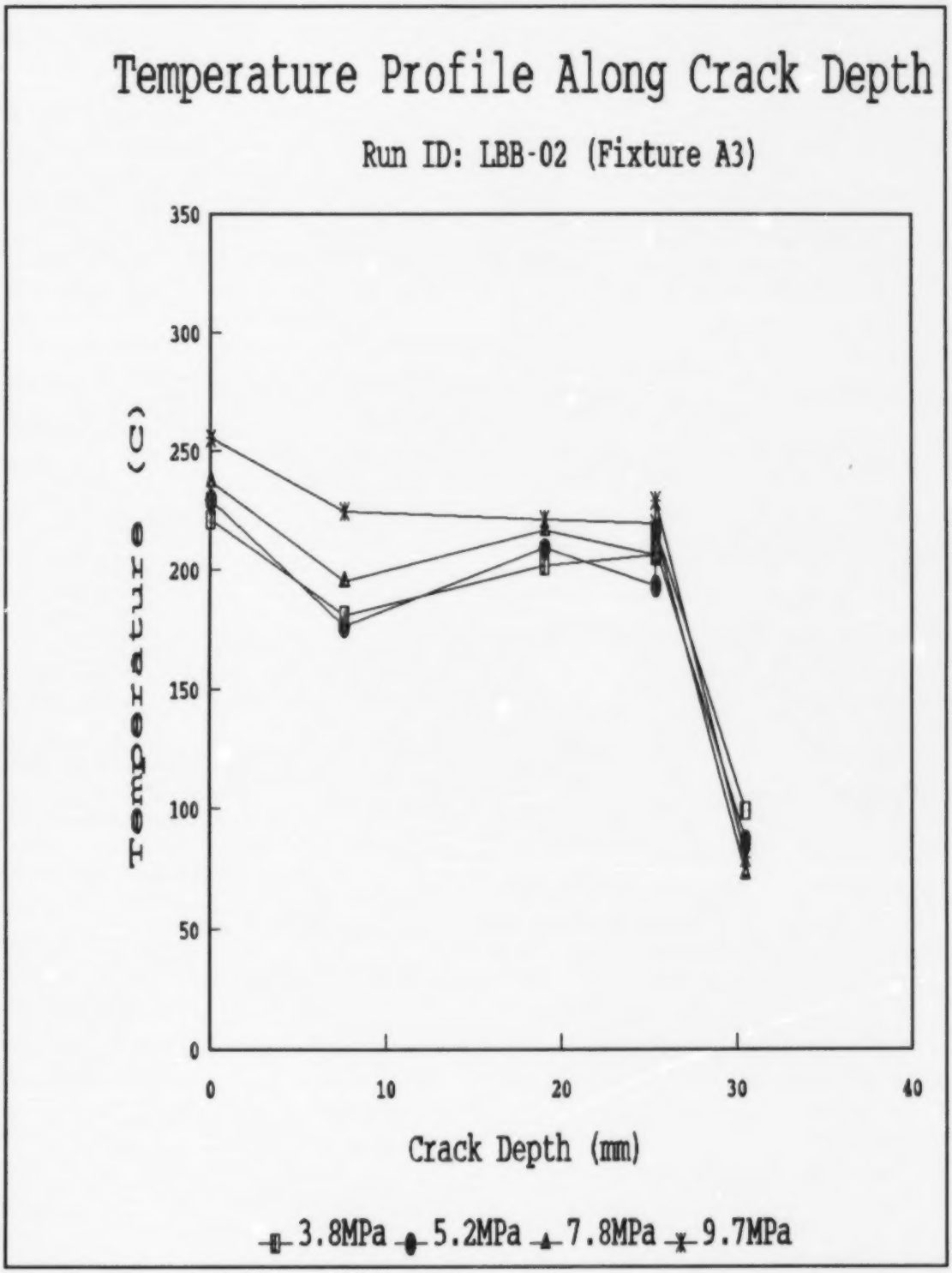

FIGURE AIV-2

Temperature Profile Through Crack

TESTS (Low ac CRACK LENGTH FIXTURE ONLY

DD MM YYYY hh MM SS .SS	Ch 0 Ref Trans (kPa)	Ch 1 Load Cell (kg)	Ch 2 Vessel Pressure (kPa)	Ch 3 PT 6A Crack Face Pressure (Outside Center) (kPa)	Ch 4 Fixture Cavity Pressure (kPa)	Ch 5 PT 2A Crack Face Pressure (Inside Center) (kPa)	Ch 6 PT 4A Crack Face Pressure (Outside Left') (kPa)	Ch 7 PT 3E Crack Face Pressure (Middle Center) (kPa)	Ch 8 PT 5B Crack Face Pressure (Outside Right') (kPa)	Ch 9 PT 5A Crack Face Pressure (Opposite PT 5A) (kPa)	Ch 20 Ref Temp 01 (oC)	Ch 21 Vessel Temp (oC)	Ch 22 Vessel Temp (oC)	Ch 23 Temp at FT 2A (oC)	Ch 24 Temp at FT 1A (oC)	Ch 25 Temp at FT 4A (oC)	Ch 26 Temp at FT 5A (oC)	Ch 27 Temp at FT 3E (oC)	Ch 28 Temp at FT 5B (oC)	Ch 29 Ref Temp 02 (oC)	Ch 30 (oC)	Ch 31 (oC)	Ch 32 (oC)	Ch 33 (oC)	Ch 34 (oC)	Ch 35 (oC)	Ch 36 Temp at FT 6A (oC)	SCAN #	TIME
1 1 2000 12 0 0	0	0	1	2	3	4	5	6	7	8	9	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	0	43200
1 1 2000 12 0 0	0	11	10	10	10	10	10	10	10	10	10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	43200
5 7 1989 8 42 45	0	-1.27	81.1	2425.661	-3.4475	-16.6165	-15.169	-6.6895	-19.306	-16.548	-4.137	24	222	224	23	22	22	22	22	24	24	24	24	24	24	23	23	23	1	31425
5 7 1989 8 53 22	0	1	81.1	2941.407	0	0	0	0	0	1.379	1	24	231	235	33	32	42	42	36	94	99	24	77	65	79	42	34	44	2	32002
5 7 1989 8 55 22	0	0	80.8	3046.211	0	0	0	0	0	1.379	0	24	234	237	36	37	46	52	41	103	104	24	87	73	78	49	39	50	3	32122
5 7 1989 8 57 22	0	0	81.2	3156.531	0	0	0	0	0	1.379	0	24	236	239	43	43	54	56	47	111	112	24	96	81	85	56	43	55	4	32242
5 7 1989 8 59 22	0	0	85.1	3266.851	0	0	0	0	-0.6895	1.379	0	24	237	240	49	49	60	64	53	119	122	24	104	88	92	60	48	60	5	32362
5 7 1989 9 1 23	0	0	81.4	3377.171	0	0	0	0	-0.6895	1.379	0	24	239	242	55	55	66	69	59	126	130	24	111	95	99	65	54	65	6	32483
5 7 1989 9 3 23	0	0	81.1	3269.609	0	0	0	0	-0.6895	1.379	0	24	238	242	61	62	72	74	64	134	137	24	118	101	105	70	59	71	7	32603
5 7 1989 9 5 23	0	0	81.2	3233.755	0	0	0	0	-0.6895	1.379	0	24	238	241	67	69	78	80	70	141	144	24	125	107	110	75	64	76	8	32723
5 7 1989 9 7 24	0	0	80.6	3239.271	0	1.379	0	0	-0.6895	1.379	0	24	239	241	74	77	85	87	76	147	150	24	131	112	116	80	70	81	9	32844
5 7 1989 9 9 25	0	0	80.9	3418.541	0	1.379	0	0	-6.6895	1.379	0.6895	24	24.	242	81	86	9.	92	82	153	156	24	136	117	120	85	76	86	10	32965
5 7 1989 9 11 26	0	0	81.1	3564.715	0	1.379	0	0	-0.6895	1.379	0	24	242	245	89	98	96	97	94	153	153	24	138	119	121	90	82	9.	11	33086
5 7 1989 9 13 26	0	0	81	3705.373	0	1.379	-1.379	0	-0.6895	1.379	0	24	244	247	92	99	100	99	98	150	152	24	137	119	120	93	87	93	12	33206
5 7 1989 9 15 27	0	0	80.7	3845.3415	0	1.379	0	0	-0.6895	1.379	0.6895	24	24.	249	96	99	101	104	99	158	161	24	142	122	125	96	91	96	13	33327
5 7 1989 9 17 28	0	0	81.3	3983.2415	0	1.379	0	0	-0.6895	1.379	0	24	248	251	98	100	101	107	100	164	168	24	146	126	129	99	94	99	14	33448
5 7 1989 9 19 28	0	0	81	3872.9215	0	0	-1.379	0	-0.6895	1.379	0.6895	24	248	251	99	100	101	111	100	170	173	24	150	129	132	102	97	102	15	33568
5 7 1989 9 21 29	0	0	81	3837.0675	0	0	-1.379	0	-0.6895	1.379	0	24	247	251	100	100	101	114	100	174	177	24	154	132	136	104	99	104	16	33689
5 7 1989 9 23 30	0	0	80.9	3810.177	0	0	-1.379	0	-0.6895	0	0.6895	24	247	250	101	100	111	117	102	178	181	24	158	135	139	106	102	106	17	33810
5 7 1989 9 25 30	0	0	81	3999.7895	0	0	-1.379	0	-0.6895	1.379	0.6895	24	249	251	105	101	110	120	110	181	184	24	162	139	143	108	105	109	18	33930
5 7 1989 9 27 31	0	0	81.1	3917.0495	0	0	0	0	-2.0685	1.379	0.6895	24	249	252	109	102	119	122	113	185	187	24	166	141	145	109	107	109	19	34051
5 7 1989 9 29 32	0	0	81	3889.4695	0	0	-1.379	0	-2.0685	0	0.6895	24	248	252	111	103	122	125	116	188	190	24	169	144	147	111	109	111	20	34172
5 7 1989 9 39 48	0	0	80.5	4485.1975	0	-1.379	-1.379	0	-2.0685	0	0	24	255	256	123	114	132	136	127	199	201	24	178	150	153	118	120	118	21	34786
5 7 1989 9 41 50	0	0	81	4399.6995	0	-1.379	-1.379	0	-2.0685	1.379	0.6895	24	255	256	124	115	134	136	129	199	201	24	178	151	153	118	121	118	22	34910
5 7 1989 9 43 50	0	0	80.8	4352.8135	0	-1.379	-1.379	0	-2.0685	0	0	24	255	258	126	116	135	139	131	200	202	24	180	151	154	119	122	119	23	35030
5 7 1989 9 45 51	0	0	80.9	4319.7175	0	-1.379	-1.379	0	-2.0685	0	0	24	254	257	127	118	137	141	132	202	204	24	182	153	156	120	124	120	24	35151
5 7 1989 9 54 28	0	0	83.6	4246.0095	0	-1.379	-1.379	0	-2.0685	0	0	24	253	256	132	122	140	144	136	203	206	24	101	153	155	123	128	123	25	35668
5 7 1989 10 39 45	0	0	83.8	3955.6615	0	0	-1.379	0	-0.6895	0	0	25	248	252	151	140	160	164	156	225	227	25	205	178	181	145	145	145	26	38385
5 7 1989 10 47 1	0	0	83.7	4454.8595	0	0	0	0	-2.0685	0	0	25	247	251	156	147	167	171	162	232	233	25	211	184	189	153	151	153	27	38821
5 7 1989 10 47 39	0	0	83.6	4460.3755	-0.6895	0	-1.379	0	-2.0685	0	0	25	248	251	157	148	168	172	163	233	233	25	212	185	189	153	152	154	28	38859
5 7 1989 10 47 43	0	0	83.6	4460.3755	0	0	-1.379	0	-2.0685	0	0	25	247	251	157	148	168	172	163	233	233	25	212	185	189	154	152	154	29	38863
5 7 1989 10 47 47	0	0	83.6	4460.3755	0	0	-1.379	0	-2.0685	0	0	25	247	251	157	148	168	172	163	233	233	25	212	185	189	154	152	154	30	38867
5 7 1989 10 47 51	0	0	83.6	4460.3755	0	0	-1.379	0	-2.0685	0	0	25	247	251	157	148	168	172	163	233	233	25	212	185	189	154	152	154	31	38871
5 7 1989 10 49 0	0	0	83.6	4463.1335	0	0	0	0	-0.6895	0	0	25	247	251	158	150	169	172	164	227	225	25	208	184	187	155	153	155	32	38940
5 7 1989 10 49 4	0	0	83.9	4463.1335	0	0	0	0	-0.6895	0	0	25	247	251	158	150	169	172	164	227	224	25	208	184	187	155	153	155	33	38944
5 7 1989 10 49 8	0	0	83.9	4463.1335	0	0	0	0	-2.0685	0	0	25	247	251	158	150	169	172	164	226	224	25	208	184	187	155	153	155	34	38948
5 7 1989 10 49 12	0	0	85.2	4253.5255	884.628	485.408	790.167	732.249	610.207	152.379	530.225	25	247	251	175	200	185	179	191	185	186	25	187	169	175	101	77	143	35	38952
5 7 1989 10 49 16	0	0	87.3	4060.4655	1894.74	3843.9625	2079.53	1891.29	2074.70	1870.61	1969.21	25	247	251	171	215	199	207	201	215	211	25	119	103	122	101	81	119	36	38956
5 7 1989 10 49 20	0	0	88.8	3900.5015	1863.71	3719.8525	2169.85	2105.04	2146.41	1839.58	1960.24	25	247	251	174	215	208	208	205	217	210	25	90	101	116	102	81	102	37	38960
5 7 1989 10 49 24	0	0	90.5	3861.8895	1832.00	3710.1995	2308.44	2069.18	2207.08	1792.7	1958.86	25	246	251	177	218	207	207	205	217	208	25	97	104	110	100	80	101	38	38964
5 7 1989 10 49 28	0	0	92.4	3864.6475	1786.49	3715.7155	2353.95	2038.85	2240.18	1763.74	1936.80	25	239	251	181	220	207	207	204	217	207	25	89	103	102	99	80	100	39	38968
5 7 1989 10 49 32	0	0	94	3872.9215	1732.02	3735.0215	2396.70	2018.85	2268.45	1726.99	1914.74	25	239	251	183	223	209	206	202	217	206	25	95	101	98	97	81	95	40	38972

*** Outer Surface of Fixture ***

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90-289

LAB 02

LBB TESTS (100 mm CRACK LENGTH FIXTURE ONLY)

DD MM YYYY hh MM SS	.SS	Ch 0 Ref Trans	Ch 1 Load Cell	Ch 2 Vessel Pressure	Ch 3 PT 6A Crack Face Pressure (Outside Center)	Ch 4 Fixture Cavity Pressure	Ch 5 PT 2A Crack Face Pressure (Inside Center)	Ch 6 PT 4A Crack Face Pressure (Outside Left)	Ch 7 PT 3E Crack Face Pressure Middle Center)	Ch 8 PT 5B Crack Face Pressure (Outside Right)	Ch 9 PT 5A Crack Face Pressure Opposite	Ch 20 Ref Temp	Ch 21 Vessel Temp	Ch 22 Vessel Temp	Ch 23 Temp at PT 2A	Ch 24 Temp at PT 3A	Ch 25 Temp at PT 4A	Ch 26 Temp at PT 5A	Ch 27 Temp at PT 5B	Ch 28 Temp at PT 6A	Ch 29 Ref Temp	Ch 30	Ch 31	Ch 32	Ch 33	Ch 34	Ch 35	Ch 36 Temp at Fixture xxx	SCAN #	TIME
		(kPa)	(kg)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(kPa)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)	(oC)		
S 7 1989 10 49 36		0	0	95	3894.9655	1a92.72	37b1.912	2442.29	1998.86	2291.29	1a56.93	1874.75	25	275	259	185	225	1c5	2eb	2c1	217	1d5	23	9b	122	98	95	8b	94	41	38976
S 7 1989 10 49 41		0	0	9a.b	3897.743E	1a51.35	37a7.428	245a.66	1970.59	2267.75	1a32.73	1876.65	25	275	259	187	22e	1de	2e9	2c6	217	1c+	23	9+	122	95	9+	79	91	42	38981
S 7 1989 10 49 45		0	0	98.2	3903.2569	1569.99	3748.8115	2479.44	1912.a7	2349.82	1582.1e	1767.52	25	24(	259	184	22e	1c3	2c2	195	217	1c1	23	8e	1e1	95	91	8+	91	43	38985
S 7 1989 10 49 49		0	0	99.5	3956.4195	339.581	16ae.4765	702.a00	479.202	497.819	3b .b6E	359...4	25	24(	25(	155	19(	12b	11?	11e	157	122	23	92	1e1	94	94	82	8E	44	38989
S 7 1989 10 49 53		0	0	99.5	4019.0955	4.137	384.741	a2.7445	104.8n4	42.0595	7e.8245	71.708	25	242	259	109	127	91	87	99	95	98	23	9a	102	99	1n0	85	9a	45	38993
S 7 1989 10 49 57		0	0	99.5	4057.7075	-.6895	197.8865	-53.781	2a.201	-8.9635	22.4a45	7.5845	25	241	259	94	10E	1cc	9E	1n0	1n(	96	23	9a	95	1e1	102	91	1e1	4c	38997
S 7 1989 10 50 49		0	0	99.5	4261.7995	3.4475	14.4795	-47.575	-2.758	-6.2055	-1.0685	1.379	25	245	251	101	102	101	121	101	139	124	25	112	117	126	119	99	11a	47	39049
S 7 1989 10 59 59		0	0	99.6	5651.142	6.6895	1.379	-4.137	-1.379	-4.137	1.379	-6.6895	25	242	251	122	11(	12e	12a	124	143	141	25	127	121	126	116	11e	11a	48	39599
S 7 1989 11 2 0		0	0	99.6	5645.626	6.6895	0	-3.4475	-6.6895	-4.8265	1.379	0	25	244	251	121	11e	124	124	122	139	13e	25	122	119	122	114	115	114	49	39720
S 7 1989 11 2 4		0	0	99.7	5645.626	6.6895	1.379	-3.4475	-6.6895	-4.8265	1.379	0	25	244	251	121	11e	124	124	122	139	13e	25	122	119	122	114	115	114	50	39724
S 7 1989 11 2 8		0	0	101.E	5449.608	2042.a7	1111.474	2119.52	2476.0e	2213.98	2038.85	2150.55	25	241	251	165	23(	18e	207	208	202	215	25	91	92	102	9e	77	9e	51	39728
S 7 1989 11 2 12		0	0	104	5449.888	212e.41	5685.752	2382.91	2519.43	2380.84	2049.68	2185.02	25	239	251	164	22e	18E	205	207	203	214	25	95	94	98	94	8n	92	52	39732
S 7 1989 11 2 16		0	0	106.1	5455.324	2117.45	5111.953	2540.80	2596.33	2423.59	2002.99	2170.54	25	238	251	1ee	225	1E1	207	211	205	213	25	92	89	92	92	8.	8E	53	39736
S 7 1989 11 2 20		0	0	108.1	5469.114	2078.84	5139.533	2551.83	2492.92	2482.66	1987.e9	2167.09	25	237	251	168	227	187	208	210	209	212	25	87	89	88	91	8n	8a	54	39740
S 7 1989 11 2 24		0	0	110.1	5480.14e	2077.46	5169.1815	2e36.e4	2473.23	2524.94	1947.83	2162.27	25	23e	251	174	229	189	207	209	211	211	25	8e	86	87	9n	80	87	55	39744
S 7 1989 11 2 28		0	0	112.1	5462.9e4	2066.43	5182.282	2752.46	2457.37	2541.49	1965.77	2145.03	25	235	251	179	22(	18E	20a	209	212	211	25	84	8e	85	87	80	Ee	5e	39748
S 7 1989 11 2 32		0	0	114.1	5488.42	2077.46	5187.798	2737.31	2450.48	2578.73	1987.16	2122.97	25	233	251	183	222	1e2	206	210	212	210	25	83	84	84	87	86	85	57	39752
S 7 1989 11 2 36		0	0	115.9	5488.42	2051.95	5189.8665	2756.62	2425.66	2e02.86	1973.37	2106.42	25	231	251	186	232	1e2	2e6	208	212	209	25	82	84	83	88	80	85	5e	3975e
S 7 1989 11 2 40		0	0	118	5488.42	2013.34	5196.7615	2833.84	2432.24	2e16.72	1957.51	2109.18	25	23e	251	190	234	2e(	2e6	207	211	209	25	82	82	81	87	79	84	59	397a0
S 7 1989 11 2 44		0	0	119.8	5543.56	e12.276	3037.937	1439.67	823.263	823.952	552.974	e2e.494	25	228	251	167	21(	15e	139	144	169	115	25	79	81	79	85	6.	83	60	39764
S 7 1989 11 2 49		0	0	119.4	5615.266	17.927	551.6	165.48	127.557	61.361	e5.5925	ee.6e15	25	228	251	110	12e	9e	92	100	97	87	25	81	81	80	9n	81	84	61	39769
S 7 1989 11 2 52		0	0	119.4	5656.65e	6.6895	179.9595	28.959	19.9955	-2.758	2.0685	9.653	25	229	251	92	109	84	9a	100	100	95	25	82	81	81	97	84	8e	e2	39772
S 7 1989 11 2 56		0	0	119.4	5692.512	0	92.393	0	0.6895	-4.8265	1.379	2.0685	25	23(	252	96	104	102	100	100	100	99	25	8?	8(	81	95	86	8E	e3	3977e
S 7 1989 11 3 0		0	0	119.4	5725.668	0	55.8495	-3.4475	-6.895	-4.8265	0	0.6895	25	231	252	100	102	101	101	100	100	95	25	85	81	82	97	91	9e	e4	39780
S 7 1989 11 3 4		0	0	119.4	5750.764	0	42.749	-4.137	-7.5845	-6.2055	0	0.6895	25	231	252	1e1	102	1e0	102	104	100	100	25	85	80	84	98	92	92	65	39784
S 7 1989 11 3 6		0	0	119.4	5769.042	0	37.233	-4.137	-7.5845	-6.2055	0	0.6895	25	232	252	101	102	1e0	103	109	101	101	25	8e	80	83	99	94	92	ee	39788
S 7 1989 11 3 12		0	0	119.4	5816.622	0	33.7855	-4.137	-6.895	-6.2055	-1.379	0	25	232	252	101	102	1e0	104	111	108	102	25	86	81	84	100	94	93	e7	39792
S 7 1989 11 3 16		0	0	119.5	5844.282	0	31.0275	-5.516	-6.895	-6.2055	-1.379	0	25	232	253	101	102	101	104	111	112	101	25	87	79	85	100	94	92	68	39796
S 7 1989 11 3 20		0	0	119.3	5869.024	0.6895	27.58	-5.516	-6.2055	-6.2055	-1.379	0	25	233	253	101	102	101	104	111	114	104	25	87	78	86	99	95	91	69	39800
S 7 1989 11 3 24		0	0	119.4	5893.846	0.6895	25.5115	-5.516	-5.516	-6.2055	0	0.6895	25	234	253	101	102	101	105	111	116	104	25	87	78	87	99	97	92	70	39804
S 7 1989 11 3 28		0	0	119.4	5918.668	0.6895	22.7535	-5.516	-5.516	-6.2055	0	0.6895	25	235	253	101	102	101	105	112	118	105	25	88	78	88	101	98	92	71	39808
S 7 1989 11 3 32		0	0	119.4	5937.974	0.6895	20.685	-5.516	-5.516	-6.2055	0	0.6895	25	235	253	101	102	102	113	112	119	101	25	89	76	88	101	98	92	72	39812
S 7 1989 11 3 36		0	0	119.5	5957.28	0.6895	19.9955	-5.516	-4.8265	-6.2055	0	0	25	235	253	101	102	102	116	112	120	102	25	90	78	89	101	98	95	73	39816
S 7 1989 11 3 40		0	0	119.4	5973.828	0.6895	17.2375	-5.516	-4.8265	-6.2055	0	0	25	235	253	101	102	102	118	112	121	104	25	90	78	90	102	98	96	74	39820
S 7 1989 11 3 44		0	0	119.4	5993.134	0.6895	16.548	-5.516	-4.8265	-6.2055	0	0	25	236	253	101	102	102	118	112	121	107	25	91	78	91	102	97	97	75	39824
S 7 1989 11 3 48		0	0	119.5	6009.682	1.379	15.169	-5.516	-4.8265	-6.2055	0	0	25	236	253	101	102	102	119	111	121	109	25	92	78	91	102	98	97	76	39828
S 7 1989 11 3 52		0	0	119.5	6026.23	1.379	14.4795	-5.516	-4.8265	-4.8265	0	0	25	237	253	101	102	102	119	110	121	110	25	93	79	92	103	98	98	77	39832
S 7 1989 11 3 56		0	0	119.5	6042.778	1.379	13.1005	-5.516	-4.8265	-4.8265	0	0.6895	25	237	253	101	101	102	119	110	121	111	25	93	81	92	103	98	99	78	39836
S 7 1989 11 4 1		0	0	119.4	6056.568	1.379	12.411	-5.516	-4.8265	-6.2055	0	0.6895	25	237	253	101	102	102	120	110	122	112	25	93	82	93	104	97	10(	79	39841
S 7 1989 11 4 5		0	0	119.5	6070.358	1.379	11.032	-5.516	-4.137	-4.8265	0	0.6895	25	237	253	101	101	102	120	109	122	113	25	95	83	94	104	97	101	80	39845
S 7 1989 11 4 9	0	0.689	119.5	6084.148	1.379	11.032	-5.516	-4.137	-4.8265	0	0.6895	25	236	253	103	101	102	120	109	123	115	25	96	84	94	104	97	101	81	39849
S 7 1989 11 4 13		0	0	119.5	6097.938	1.379	9.653	-5.516	-4.137	-4.8265	0	0.6895	25	238	253	104	101	102	120	110	123	116	25	96	84	95	105	97	101	82	39853

LBB TESTS (10% BA CRACK LENGTH FIXTURE ONLY)

DD MM YYYY HH MM SS .SS	Ch 0 Rev Trans (kPa)	Ch 1 Load Cell (kg)	Ch 2 Vessel Pressure (kPa)	Ch 3 PT 6A Crack Face Pressure (Outside Center) (kPa)	Ch 4 Fixture Cavity Pressure (kPa)	Ch 5 PT 2A Crack Face Pressure (Inside Center) (kPa)	Ch 6 PT 4A Crack Face Pressure (Outside 'Left') (kPa)	Ch 7 PT 3B Crack Face Pressure (Middle Center) (kPa)	Ch 8 PT 5B Crack Face Pressure (Outside 'Right') (kPa)	Ch 9 PT 5A Crack Face Pressure (Opposite PT 5A) (kPa)	Ch 20 Ref Temp #1 (oC)	Ch 21 Vessel Temp (oC)	Ch 22 Vessel Temp (oC)	Ch 23 Temp at PT 2A (oC)	Ch 24 Temp at PT 1A (oC)	Ch 25 Temp at PT 4A (oC)	Ch 26 Temp at PT 5A (oC)	Ch 27 Temp at PT 3B (oC)	Ch 28 Temp at PT 5B (oC)	Ch 29 Ref Temp #2 (oC)	Ch 0 (oC)	Ch 31 (oC)	Ch 32 (oC)	Ch 33 (oC)	Ch 34 (oC)	Ch 35 (oC)	Ch 36 Inner Surface at Fixture Temp #4 (oC)	SCAN #	TIME
5 7 1989 11 4 17	0	0	115.5	a106.97	1.379	8.9635	-5.516	-4.137	-4.8265	0	0.6895	25	236	253	105	101	102	121	111	124	117	25	94	84	95	105	97	101	82	39857
5 7 1989 11 4 21	0	0	115.4	a120.002	1.379	8.9635	-5.516	-4.137	-4.8265	0	0.6895	25	236	253	105	101	102	120	110	124	117	25	89	84	9a	105	97	101	84	39861
5 7 1989 11 4 25	0	0	115.5	a131.034	1.379	7.5845	-5.516	-4.137	-4.8265	0	0.6895	25	239	253	106	101	102	120	110	124	116	25	89	84	9a	105	97	101	85	39865
5 7 1989 11 4 29	0	0.689	115.5	a139.308	1.379	7.5845	-5.516	-4.8265	-6.2055	0	0.6895	25	239	252	106	101	102	120	110	125	116	25	89	84	9a	105	98	101	86	39869
5 7 1989 11 4 33	0	0.689	115.5	a150.34	1.379	a.895	-5.516	-4.137	-6.2055	1.379	0.6895	25	239	252	107	101	102	120	110	125	116	25	89	85	97	105	99	101	87	39873
5 7 1989 11 4 37	0	0	115.5	a156.614	1.379	a.895	-5.516	-4.8265	-4.8265	-1.379	0.6895	25	239	252	107	101	102	120	110	125	119	25	88	85	97	105	100	101	88	39877
5 7 1989 11 4 41	0	0	115.5	a166.888	1.379	5.516	-5.516	-4.137	-4.8265	0	0.6895	25	239	252	108	101	103	120	110	125	119	25	88	85	97	105	100	101	89	39881
5 7 1989 11 4 45	0	0.689	115.5	a172.404	1.379	5.516	-5.516	-4.137	-4.8265	0	0.6895	25	239	252	108	101	102	120	110	125	119	25	90	86	98	104	101	101	90	39885
5 7 1989 11 4 49	0	0	115.5	a180.678	1.379	4.137	-5.516	-4.137	-4.8265	1.379	0.6895	25	240	252	108	101	104	120	110	124	119	25	90	86	98	104	102	101	91	39889
5 7 1989 11 4 53	0	0	115.5	a186.194	1.379	4.137	-5.516	-4.137	-4.8265	1.379	0.6895	25	240	252	109	101	109	120	110	124	120	25	91	86	98	104	102	101	92	39893
5 7 1989 11 4 57	0	0	115.4	a194.468	1.379	4.137	-5.516	-4.137	-4.8265	0	0.6895	25	240	252	109	101	112	120	110	124	120	25	91	87	98	104	103	101	93	39897
5 7 1989 11 5 1	0	0	115.5	a199.984	1.379	3.4475	-5.516	-4.137	-4.8265	1.379	0.6895	25	240	252	109	101	113	120	110	124	120	25	92	87	99	104	102	101	94	39901
5 7 1989 11 5 4	0	0	115.5	a205.5	1.379	3.4475	-5.516	-4.137	-4.8265	1.379	0.6895	25	240	252	110	101	114	120	110	124	120	25	92	88	98	104	103	101	95	39904
5 7 1989 11 5 8	0	0	115.5	a211.016	1.379	3.4475	-5.516	-3.4475	-4.8265	1.379	0.6895	25	240	252	110	101	115	119	110	124	120	25	93	88	98	104	104	101	95	39908
5 7 1989 11 5 12	0	0	115.5	a216.532	1.379	3.4475	-5.516	-4.137	-4.8265	1.379	0.6895	25	240	252	110	101	116	119	110	124	120	25	93	88	98	104	104	101	96	39912
5 7 1989 11 5 16	0	0	115.5	a222.048	1.379	3.4475	-5.516	-3.4475	-4.8265	0	0.6895	25	240	252	110	101	116	119	110	124	120	25	95	89	92	104	104	101	96	39916
5 7 1989 11 5 20	0	0	115.4	a227.564	1.379	2.0685	-5.516	-3.4475	-6.2055	0	0.6895	25	240	252	110	101	116	119	110	124	120	25	96	89	92	104	105	101	98	39920
5 7 1989 11 5 24	0	0	115.5	6233.08	1.379	2.0685	-5.516	-3.4475	-4.8265	0	0.6895	25	240	252	110	101	117	119	110	124	120	25	97	90	92	104	105	100	99	39924
5 7 1989 11 5 28	0	0	115.5	a235.838	1.379	2.0685	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	111	101	117	119	110	124	121	25	98	91	95	103	105	100	100	39928
5 7 1989 11 5 32	0	0	115.5	6241.354	1.379	2.0685	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	111	101	117	118	110	123	121	25	99	91	95	103	105	100	101	39932
5 7 1989 11 5 36	0	0	119.4	6246.87	1.379	2.0685	-5.516	-2.758	-4.8265	1.379	0.6895	25	241	252	111	102	117	118	110	123	121	25	99	92	96	103	105	99	103	39936
5 7 1989 11 5 40	0	0	119.5	6249.628	1.379	2.0685	-5.516	-2.758	-4.8265	0	0	25	241	252	111	102	117	118	110	123	121	25	100	92	96	103	106	100	104	39940
5 7 1989 11 5 45	0	0	119.6	6255.144	1.379	2.0685	-5.516	-2.758	-4.8265	1.379	0.6895	25	241	252	111	101	117	116	110	123	121	25	100	92	96	103	106	100	105	39945
5 7 1989 11 5 49	0	0	119.5	6257.902	1.379	1.379	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	111	101	117	116	110	123	121	25	101	93	96	103	106	100	106	39949
5 7 1989 11 5 53	0	0	119.5	6263.418	1.379	1.379	-5.516	-2.758	-4.8265	0	0	25	241	252	111	101	117	118	110	123	121	25	101	93	96	103	106	100	107	39953
5 7 1989 11 5 57	0	0	119.5	6266.176	1.379	0	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	111	102	117	116	110	123	121	25	103	93	97	102	106	100	108	39957
5 7 1989 11 6 1	0	0	119.4	6268.934	1.379	0	-5.516	-2.758	-4.8265	1.379	0.6895	25	241	252	111	103	117	118	110	123	121	25	102	94	95	102	104	98	109	39961
5 7 1989 11 6 5	0	0	119.5	6271.692	1.379	0	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	111	103	117	117	110	122	120	25	100	94	94	102	103	98	110	39965
5 7 1989 11 6 9	0	0	119.5	6274.45	1.379	0	-5.516	-2.758	-4.8265	0	0	25	241	252	112	103	116	117	110	122	120	25	99	94	93	102	103	98	111	39969
5 7 1989 11 6 13	0	0	119.4	6277.208	1.379	0	-6.2055	-2.758	-6.2055	0	0.6895	25	242	252	112	102	116	117	110	122	120	25	100	95	93	102	103	97	112	39973
5 7 1989 11 6 17	0	0	119.5	6279.966	1.379	0	-5.516	-2.758	-4.8265	0	0.6895	25	241	252	112	101	116	117	110	122	120	25	101	95	94	102	103	97	113	39977
5 7 1989 11 6 22	0	0	119.5	6282.724	1.379	0	-5.516	-2.758	-4.8265	0	0	25	241	252	112	101	116	117	110	121	120	25	101	95	94	102	104	97	114	39982
5 7 1989 11 6 26	0	0	119.5	6285.482	1.379	-1.379	-5.516	-2.0685	-6.2055	1.379	0.6895	25	242	252	112	102	116	117	110	121	120	25	101	95	95	102	104	97	115	39986
5 7 1989 11 6 30	0	0	119.5	6285.482	1.379	0	-5.516	-2.0685	-6.2055	0	0.6895	25	242	252	112	102	116	117	110	121	120	25	101	95	95	102	104	97	116	39990
5 7 1989 11 6 34	0	0	119.5	6288.24	1.379	0	-5.516	-2.0685	-6.2055	0	0.6895	25	242	252	112	101	116	116	110	121	121	25	102	96	96	102	104	98	117	39994
5 7 1989 11 6 38	0	0	119.6	6290.998	1.379	-1.379	-5.516	-2.0685	-4.8265	0	0.6895	25	242	252	112	101	115	116	110	121	120	25	102	96	97	102	104	98	118	39998
5 7 1989 11 6 42	0	0	119.4	6293.756	1.379	-1.379	-5.516	-2.0685	-6.2055	0	0.6895	25	242	252	112	101	115	116	110	121	120	25	102	96	97	102	105	98	119	40002
5 7 1989 11 6 46	0	0	119.5	6296.514	1.379	-1.379	-5.516	-2.0685	-6.2055	1.379	0.6895	25	242	252	112	101	115	116	110	121	120	25	101	96	98	102	105	98	120	40006
5 7 1989 11 6 50	0	0	119.5	6296.514	1.379	-1.379	-5.516	-1.379	-6.2055	0	0.6895	25	242	252	112	101	115	116	110	121	120	25	100	96	97	102	104	98	121	40010
5 7 1989 11 6 54	0	0	119.6	6299.272	1.379	-1.379	-5.516	-1.379	-6.2055	1.379	0.6895	25	242	252	112	101	115	115	110	121	120	25	101	96	98	102	104	98	122	40014
5 7 1989 11 6 59	0	0	119.5	6299.272	1.379	-1.379	-5.516	-1.379	-6.2055	1.379	0.6895	25	242	252	111	101	115	115	107	121	120	25	101	96	98	102	104	98	123	40019
5 7 1989 11 7 3	0	0	119.6	6302.03	1.379	-1.379	-5.516	-2.0685	-4.8265	1.379	0.6895	25	242	252	111	101	114	115	107	121	120	25	102	96	99	102	105	98	124	40023

LBB TESTS (100 mm CRACK LENGTH FIXTURE ONLY!)

DD MM YYYY Hh MM SS .SS	Ch 0 Ref Trans (kPa)	Ch 1 Load Cell (kg)	Ch 2 Vessel Pressure (kPa)	Ch 3 PT 6A Crack Face Pressure (Outside Center) (kPa)	Ch 4 Fixture Cavity Pressure (kPa)	Ch 5 PT 2A Crack Face Pressure (Inside Center) (kPa)	Ch 6 PT 4A Crack Face Pressure (Outside 'Left') (kPa)	Ch 7 PT 3B Crack Face Pressure (Middle Center) (kPa)	Ch 8 PT 5B Crack Face Pressure (Outside 'Right') (kPa)	Ch 9 PT 5A Crack Face Pressure (Opposite PT 5A) (kPa)	Ch 20 Ref Temp #1 (oC)	Ch 21 vessel Temp (oC)	Ch 22 Vessel Temp (oC)	Ch 23 Temp at PT 2B (oC)	Ch 24 Temp at PT 1A (oC)	Ch 25 Temp at PT 4A (oC)	Ch 26 Temp at PT 5A (oC)	Ch 27 Temp at PT 3B (oC)	Ch 28 Temp at PT 5B (oC)	Ch 29 Ref Temp #2 (oC)	Ch 30	Ch 31	Ch 32	Ch 33	Ch 34	Ch 35	Ch 36 Temp at PT 6A (oC)	SCAN #	TIME
5 7 1989 11 7 7	0	0	119.4	6302.03	1.379	-1.379	-5.516	-2.0685	-4.8265	1.379	0.6895	25	242	252	111	101	114	115	107	122	120	25	103	96	99	102	105	98	125	40027
5 7 1989 11 7 11	0	0	119.5	6304.788	1.379	-1.379	-5.516	-2.0685	-6.2055	1.379	0.6895	25	242	252	111	101	114	115	107	121	120	25	102	96	99	102	105	98	126	40031
5 7 1989 11 7 22	0	0	119.6	6307.546	1.379	-2.0685	-5.516	-1.379	-6.2055	1.379	0.6895	25	242	252	111	102	114	114	106	122	120	25	104	96	99	102	105	98	127	40042
5 7 1989 11 11 36	0	0	119.6	8785.609	0.6895	-4.137	-4.137	-1.379	-6.2055	1.379	0	25	242	256	107	104	108	109	108	115	114	25	103	95	98	99	102	94	128	40298
5 7 1989 11 12 30	0	0	119.6	8804.915	0.6895	-4.137	-3.4475	-1.379	-6.2055	0	0	25	243	255	107	103	107	108	107	114	112	25	102	94	95	98	101	94	129	40350
5 7 1989 11 12 34	0	0	119.5	8804.915	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	243	255	107	103	107	108	107	114	112	25	102	94	95	98	101	94	130	40354
5 7 1989 11 12 38	0	0	122.9	8551.179	2392.56	1467.9455	2510.46	2860.04	2581.48	2155.37	2566.31	25	242	255	178	239	200	210	212	207	222	25	88	92	92	96	42	90	131	40356
5 7 1989 11 12 42	0	0	125.3	8427.7585	2579.41	7704.473	2873.83	2950.37	2834.53	2447.72	2626.30	25	237	255	175	233	195	206	210	206	222	25	81	88	87	90	51	82	132	40362
5 7 1989 11 12 46	0	0	127.1	8397.4205	2541.49	7698.2675	2843.49	2877.28	2836.60	2381.53	2576.66	25	236	255	183	234	195	208	214	213	221	25	78	85	77	85	59	74	133	40366
5 7 1989 11 12 50	0	0	130.3	8402.9365	2537.36	7707.9205	2980.70	2840.74	2877.28	2355.33	2541.45	25	234	255	187	235	207	210	215	213	220	25	74	76	76	82	59	71	134	40370
5 7 1989 11 12 54	0	0	133.1	8419.4845	2543.56	7735.432	2948.99	2844.87	2891.07	2322.92	2545.39	25	231	255	194	237	210	211	219	214	220	25	78	76	75	79	59	71	135	40374
5 7 1989 11 12 58	0	0	136	8440.859	2549.77	7755.633	3037.93	2844.87	2934.51	2329.82	2527.70	25	230	255	200	239	211	211	218	220	220	25	81	74	74	77	56	69	136	40378
5 7 1989 11 13 3	0	0	138.9	8460.165	2549.77	7781.697	3093.78	2854.53	2958.64	2309.13	2537.36	25	228	255	203	239	212	212	218	221	219	25	78	73	72	77	57	71	137	40383
5 7 1989 11 13 7	0	0	141.7	8479.471	2576.66	7812.035	3131.01	2882.79	2963.47	2295.34	2537.36	25	226	256	207	240	206	213	219	218	219	25	81	72	71	76	56	73	138	40387
5 7 1989 11 13 11	0	0	144.8	8493.261	2561.49	7827.8935	3121.36	2864.18	2993.80	2295.48	2527.70	25	226	256	210	241	215	212	219	221	219	25	85	71	71	77	56	73	139	40391
5 7 1989 11 13 15	0	0	146.2	8531.873	1296.94	4385.9095	2908.31	1512.76	1830.62	1128.71	1259.71	25	224	256	205	201	157	152	163	193	138	25	78	70	70	77	65	73	140	40395
5 7 1989 11 13 19	0	0	147.3	8741.481	57.918	814.989	257.163	179.959	135.831	76.329	64.813	25	223	256	124	119	79	85	93	109	88	25	83	70	70	79	69	76	141	40399
5 7 1989 11 13 24	0	0	147.1	8882.139	1.379	227.535	22.7535	16.548	-6.2055	7.5845	10.3425	25	221	257	89	94	95	99	100	100	92	25	88	72	72	81	75	78	142	40404
5 7 1989 11 13 28	0	0	147.2	8989.701	1.379	97.909	0	10.3425	-4.8265	1.379	1.379	25	221	257	100	100	103	100	100	101	100	25	88	71	74	84	77	81	143	40408
5 7 1989 11 13 32	0	0	147.2	9039.345	1.379	57.918	-1.379	8.274	-4.8265	1.379	0.6895	25	225	256	100	100	103	101	101	101	100	25	88	77	76	86	81	83	144	40412
5 7 1989 11 13 36	0	0	147.2	9077.957	1.379	49.644	-3.4475	6.895	-4.8265	1.379	0.6895	25	227	257	101	101	102	101	101	101	100	25	89	79	78	87	84	86	145	40416
5 7 1989 11 13 40	0	0	147.3	9113.811	0.6895	42.749	-3.4475	5.516	-4.8265	1.379	0.6895	25	228	257	101	101	102	101	101	101	100	25	89	79	80	88	85	88	146	40420
5 7 1989 11 13 44	0	0	147.3	9149.665	0.6895	37.233	-3.4475	4.8265	-4.8265	0	0.6895	25	228	257	101	101	102	101	101	101	100	25	90	79	80	90	86	89	147	40424
5 7 1989 11 13 48	0	0	147.2	9182.761	0.6895	26.6485	-3.4475	4.137	-4.8265	0	0.6895	25	229	258	101	102	102	101	101	101	101	25	90	80	81	91	87	90	148	40428
5 7 1989 11 13 52	0	0	147.4	9215.857	0.6895	26.201	-3.4475	2.758	-6.2055	0	0	25	230	258	101	102	102	101	101	101	100	25	91	80	82	92	88	92	149	40432
5 7 1989 11 13 56	0	0	147.3	9248.953	0.6895	22.7535	-3.4475	2.758	-4.8265	0	0	25	230	258	101	101	102	101	101	101	101	25	91	80	83	93	89	93	150	40436
5 7 1989 11 14 1	0	0	147.4	9279.291	0.6895	20.685	-3.4475	-0.6895	-4.8265	0	0	25	231	258	101	101	101	101	101	101	101	25	91	81	82	94	89	93	151	40441
5 7 1989 11 14 5	0	0	147.4	9312.387	0.6895	18.6165	-3.4475	-0.6895	-6.2055	0	0	25	231	258	101	102	101	101	101	101	101	25	92	81	80	94	90	94	152	40445
5 7 1989 11 14 9	0	0	147.3	9342.725	0.6895	17.2375	-3.4475	-0.6895	-6.2055	0	0	25	232	258	101	102	101	101	101	101	101	25	93	81	80	95	91	94	153	40449
5 7 1989 11 14 13	0	0	147.2	9370.305	0.6895	15.169	-3.4475	-0.6895	-6.2055	0	0	25	232	258	101	101	101	101	101	101	101	25	93	81	80	96	92	94	154	40453
5 7 1989 11 14 17	0	0	147.2	9400.643	0.6895	14.4795	-3.4475	-1.379	-6.2055	0	0	25	233	258	101	101	101	101	101	101	101	25	94	81	80	97	93	94	155	40457
5 7 1989 11 14 21	0	0	147.2	9433.739	0.6895	13.1005	-3.4475	-1.379	-4.8265	0	0	25	233	258	103	101	101	101	101	101	101	25	94	82	80	97	94	94	156	40461
5 7 1989 11 14 25	0	0	147.4	9461.319	0.6895	11.032	-3.4475	-1.379	-4.8265	0	0	25	233	259	104	101	101	101	101	101	101	25	95	83	81	98	96	94	157	40465
5 7 1989 11 14 29	0	0	147.2	9491.657	0.6895	9.653	-3.4475	-1.379	-6.2055	0	0	25	234	259	105	101	101	101	101	101	101	25	95	80	81	100	97	94	158	40469
5 7 1989 11 14 33	0	0	147.3	9519.237	0.6895	9.653	-3.4475	-1.379	-6.2055	0	0	25	235	259	105	101	101	101	101	101	101	25	96	78	82	101	98	94	159	40473
5 7 1989 11 14 37	0	0	147.3	9546.817	0.6895	8.9635	-3.4475	-0.6895	-6.2055	0	0	25	235	259	105	101	101	101	104	101	101	25	96	78	83	102	99	94	160	40477
5 7 1989 11 14 41	0	0	147.4	9571.639	0.6895	7.5845	-3.4475	-0.6895	-6.2055	0	0	25	235	259	106	101	101	101	106	101	101	25	97	78	83	103	101	93	161	40481
5 7 1989 11 14 44	0	0	147.3	9596.461	0.6895	7.5845	-3.4475	-0.6895	-6.2055	0	0	25	236	260	106	101	101	107	101	101	101	25	97	79	84	104	102	93	162	40484
5 7 1989 11 14 48	0	0	147.2	9624.041	0.6895	6.895	-3.4475	-1.379	-6.2055	0	0	25	236	260	107	101	101	108	101	101	101	25	97	79	85	104	103	92	163	40488
5 7 1989 11 14 52	0	0	147.4	9648.863	0.6895	5.516	-3.4475	-0.6895	-6.2055	0	0	25	236	260	107	101	101	109	101	101	101	25	97	79	86	104	103	92	164	40492
5 7 1989 11 18 34	0	0	147.4	10406.623	0.6895	-3.4475	-3.4475	-1.379	-6.2055	0	0	25	249	268	109	101	111	111	103	122	120	25	105	97	96	101	102	96	165	40714
5 7 1989 11 34 21	0	0	148	11443.631	0.6895	-3.4475	-2.0685	-0.6895	-6.2055	0	0	25	259	280	98	98	97	98	97	99	98	25	91	86	87	90	92	88	166	41661

LBB TESTS (100 mm CRACK LENGTH FIXTURE ONLY!)

DD MM YYYY HH MM SS	.SS	Ch 0 Ref Trans (kPa)	Ch 1 Load Cell (kg)	Ch 2 Vessel Pressure (kPa)	Ch 3 PT 6A Crack Face Pressure (Outside Center) (kPa)	Ch 4 Fixture Cavity Pressure (kPa)	Ch 5 PT 2A Crack Face Pressure (Inside Center) (kPa)	Ch 6 PT 4A Crack Face Pressure (Outside "Left") (kPa)	Ch 7 PT 3E Crack Face Pressure (Middle Center) (kPa)	Ch 8 PT 5E Crack Face Pressure (Outside "Right") (kPa)	Ch 9 PT 5A Crack Face Pressure (Opposite PT 5A) (kPa)	Ch 20 Ref Temp #1 (oC)	Ch 21 Vessel Temp (oC)	Ch 22 Vessel Temp (oC)	Ch 23 Temp at PT 2A (oC)	Ch 24 Temp at PT 1A (oC)	Ch 25 Temp at PT 4A (oC)	Ch 26 Temp at PT 5A (oC)	Ch 27 Temp at PT 3B (oC)	Ch 28 Temp at PT 5B (oC)	Ch 29 Ref Temp #2 (oC)	Ch 30	Ch 31	Ch 32	Ch 33	Ch 34	Ch 35	Ch 36 Temp at PT 6A (oC)	SCAN #	TIME
																							<<<< Outer Surface of Fixture >>>>								
5 7 1989 11 36 0	0	0	148.2	11443.631	0.6895	-4.137	-4.137	-0.6895	-6.2055	0	0	25	26.0	27.6	96	95	96	96	96	97	97	25	90	86	86	89	92	86	167	41760
5 7 1989 11 36 4	0	0	148.1	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.8	96	95	96	96	96	97	97	25	90	86	86	89	92	87	168	41764
5 7 1989 11 36 8	0	0	148	11443.631	0.6895	-4.137	-4.137	-0.6895	-6.2055	0	0	25	25.9	27.8	96	94	96	96	95	97	97	25	90	86	86	89	92	88	169	41768
5 7 1989 11 36 12	0	0	147.8	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.8	96	94	96	96	95	97	97	25	90	86	85	89	92	87	170	41772
5 7 1989 11 36 16	0	0	148.1	11446.389	0.6895	-4.137	-4.137	-0.6895	-6.2055	0	0	25	26.0	27.8	96	94	96	96	95	97	96	25	90	86	85	89	92	87	171	41776
5 7 1989 11 36 20	0	0	147.9	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.8	95	94	95	96	95	97	96	25	90	86	85	89	92	87	172	41780
5 7 1989 11 36 24	0	0	147.9	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.8	95	94	95	95	95	97	96	25	89	86	85	89	92	87	173	41784
5 7 1989 11 36 28	0	0	148	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.8	95	94	95	95	95	97	96	25	89	86	85	89	92	87	174	41788
5 7 1989 11 36 32	0	0	148.2	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.8	95	94	95	95	95	97	96	25	89	86	85	89	92	87	175	41792
5 7 1989 11 36 36	0	0	147.9	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.8	95	94	95	95	95	97	96	25	89	86	85	89	92	87	176	41796
5 7 1989 11 36 40	0	0	148.1	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	86	85	89	92	87	177	41800
5 7 1989 11 36 44	0	0	147.9	11446.389	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	86	85	89	92	87	178	41804
5 7 1989 11 36 49	0	0	147.8	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	86	85	89	92	87	179	41809
5 7 1989 11 36 53	0	0	148.2	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	86	85	89	91	87	180	41813
5 7 1989 11 36 57	0	0	148.1	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	85	85	88	91	87	181	41817
5 7 1989 11 37 1	0	0	148.2	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	85	85	88	91	87	182	41821
5 7 1989 11 37 5	0	0	148.1	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	95	94	95	95	95	97	96	25	89	85	85	88	91	87	183	41825
5 7 1989 11 37 9	0	0	148.1	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	25.9	27.7	95	94	95	95	94	97	96	25	89	85	85	88	91	87	184	41829
5 7 1989 11 37 13	0	0	148.3	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	25.9	27.7	95	93	95	95	94	96	96	25	89	85	85	88	91	87	185	41833
5 7 1989 11 37 17	0	0	148	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	95	93	95	95	94	96	96	25	89	85	85	88	91	87	186	41837
5 7 1989 11 37 22	0	0	147.9	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	95	93	95	95	94	96	96	25	89	85	85	88	91	87	187	41842
5 7 1989 11 37 26	0	0	148.1	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	95	93	95	95	94	96	96	25	89	85	85	88	91	87	188	41846
5 7 1989 11 37 30	0	0	147.9	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	94	93	95	95	94	96	95	25	89	85	85	88	91	87	189	41850
5 7 1989 11 37 34	0	0	148	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	94	93	95	94	94	96	95	25	88	85	85	88	91	87	190	41854
5 7 1989 11 37 38	0	0	148	11443.631	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	94	93	94	94	94	96	95	25	88	85	85	88	91	87	191	41858
5 7 1989 11 37 42	0	0	148	11440.873	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	25.9	27.7	94	93	94	94	94	96	95	25	88	85	84	88	91	87	192	41862
5 7 1989 11 37 46	0	0	148	11440.873	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.6	94	93	94	94	94	96	95	25	88	84	84	88	91	87	193	41866
5 7 1989 11 37 49	0	0	148	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.2055	0	0	25	26.0	27.7	94	93	94	94	94	96	95	25	88	84	84	88	91	87	194	41869
5 7 1989 11 37 53	0	0	148	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.7	94	93	94	94	94	96	95	25	88	84	84	88	91	87	195	41873
5 7 1989 11 37 57	0	0	148.2	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.6	94	93	94	94	94	96	95	25	88	84	84	88	91	87	196	41877
5 7 1989 11 38 1	0	0	148.1	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.6	94	93	94	94	94	96	95	25	88	84	84	88	91	87	197	41881
5 7 1989 11 38 6	0	0	148.1	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.6	94	93	94	94	94	96	95	25	88	84	84	88	91	87	198	41886
5 7 1989 11 38 10	0	0	148	11438.115	0.6895	-4.137	-3.4475	-0.6895	-6.895	0	0	25	26.0	27.6	94	93	94	94	94	96	95	25	88	84	84	87	91	86	199	41890
5 7 1989 11 38 14	0	0	149.6	11176.105	3104.81	7367.3075	3249.61	2896.58	3384.06	988.743	2655.95	25	25.9	27.6	208	250	231	228	235	239	216	25	76	78	76	81	71	79	200	41894
5 7 1989 11 38 18	0	0	152.5	10784.469	3418.54	9928.1105	4969.22	3635.04	4203.19	2700.08	2900.72	25	25.7	27.6	209	254	222	219	223	229	226	25	79	79	81	82	78	82	201	41898
5 7 1989 11 38 22	0	0	155.3	10566.587	3162.04	9783.3155	4947.16	3414.40	4079.08	2456.06	2689.05	25	25.3	27.6	220	254	218	215	219	227	220	25	80	80	82	82	80	82	202	41902
5 7 1989 11 38 26	0	0	158.4	10447.993	3044.83	9701.9545	4927.16	3286.84	3996.34	2325.68	2582.17	25	25.4	27.6	223	254	221	215	223	226	217	25	80	80	82	83	81	83	203	41906
5 7 1989 11 38 30	0	0	161.1	10398.349	2965.53	9679.8905	4904.41	3221.34	4034.26	2267.76	2503.57	25	25.2	27.5	227	256	217	217	219	227	217	25	80	80	81	82	82	83	204	41910
5 7 1989 11 38 35	0	0	164	10395.591	2965.53	9679.8905	4943.02	3201.34	4017.02	2241.56	2476.68	25	25.1	25.8	233	258	220	216	224	231	217	25	73	72	77	78	67	76	205	41915
5 7 1989 11 38 39	0	0	166.7	10417.655	2869.69	9518.5475	4991.98	3137.91	3963.24	2191.23	2441.51	25	24.9	25.3	235	256	219	211	220	233	212	25	66	64	72	71	60	70	206	41919
5 7 1989 11 38 43	0	0	167.9	10602.441	252.357	2160.2035	716.390	541.947	423.353	206.160	182.717	25	24.8	25.2	161	115	96	91	118	114	84	25	71	64	69	71	68	71	207	41923
5 7 1989 11 38 47	0	0	167.8	10803.775	0	183.407	-8.9635	50.3335	-2.0685	-1.379	3.4475	25	24.7	25.3	104	89	85	99	100	102	98	25	76	64	70	75	74	73	208	41927

LBB TESTS (10v as CRACK LENGTH FIXTURE ONLY!)

DD MM YYYY HH MM SS	.SS	Ch 0 Ref Trans (kPa)	Ch 1 Load Cell (kg)	Ch 2 Vessel Pressure (kPa)	Ch 3 PT 6A Crack Face Pressure (Outside Center) (kPa)	Ch 4 Fixture Cavity Pressure (kPa)	Ch 5 PT 2A Crack Face Pressure (Inside Center) (kPa)	Ch 6 PT 4A Crack Face Pressure (Middle 'Left') (kPa)	Ch 7 PT 3B Crack Face Pressure (Middle Center) (kPa)	Ch 8 PT 5B Crack Face Pressure (Outside 'Right') (kPa)	Ch 9 PT 5A Crack Face Pressure (Opposite PT 5B) (kPa)	Ch 20 Ref Temp 01 (oC)	Ch 21 Vessel Temp (oC)	Ch 22 Vessel Temp (oC)	Ch 23 Temp at PT 2A (oC)	Ch 24 Temp at PT 1A (oC)	Ch 25 Temp at PT 4A (oC)	Ch 26 Temp at PT 5A (oC)	Ch 27 Temp at PT 3B (oC)	Ch 28 Temp at PT 5B (oC)	Ch 29 Ref Temp 02 (oC)	Ch 30 (oC)	Ch 31 (oC)	Ch 32 (oC)	Ch 33 (oC)	Ch 34 (oC)	Ch 35 (oC)	Ch 36 Temp at PT 6A (oC)	SCAN #	TIME

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